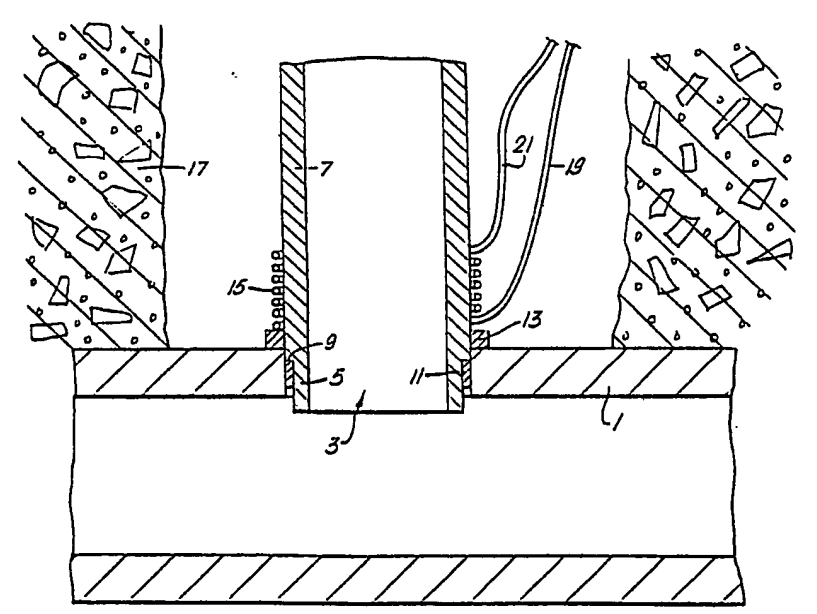




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification<sup>3</sup>: B29C 27/04; B23K 13/00</p>	<p>A1</p>	<p>(11) International Publication Number: WO 81/02405 (43) International Publication Date: 3 September 1981 (03.09.81)</p>
<p>(21) International Application Number: PCT/GB81/00027 (22) International Filing Date: 25 February 1981 (25.02.81) (31) Priority Application Number: 8006263 (32) Priority Date: 25 February 1980 (25.02.80) (33) Priority Country: GB (71) Applicant (for all designated States except US): HAXEY ENGINEERING LIMITED [GB/GB]; High Street, Haxey, Doncaster, South Yorkshire, DN9 2HH (GB). (72) Inventor; and (75) Inventor/Applicant (for US only): RICE, Nigel, Leonard [GB/GB]; Epworth Grange, Beltoft Road, Epworth, NR. Doncaster, South Yorkshire (GB). (74) Agent: HARRISON, Michael, Robert; Urquhart-Dykes &amp; Lord, 11th Floor, Tower House, Merrion Way, Leeds, LS2 8PB (GB).</p>		<p>(81) Designated States: AT (European patent), DE (European patent), DK, FR (European patent), GB (European patent), JP, NL (European patent), SE (European patent), US.  Published With international search report</p>
<p>(54) Title: METHOD FOR INTERCONNECTING PIPES (57) Abstract  A method for forming a lateral connection between a first pipe and a second pipe comprises the introduction of the end of the second pipe (7) into a hole (3) in the first pipe, the end of the second pipe carrying or incorporating electrically conducting elements (11) which may be in the form of a ring coated with polymeric material. The second pipe is provided with means (15) for inducing a current in the electrically conducting element and a current is induced to heat the elements causing melting of the material of the first and/or second pipe in the vicinity of a hole so effecting a fused joint between the first and the second pipe.</p> 		

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METHOD FOR INTERCONNECTING PIPES

This invention relates to a method for interconnecting pipes and in particular for forming a lateral connection between a service pipe and a  
5 mains pipe.

Faulty sewerage systems may be relined by the insertion of plastic pipelines. In order to avoid digging to the full depth of the sewerage main to connect the service pipe or lateral, the point of  
10 entry can be determined from the surface and a hole drilled through which the service pipe can then be fed.

This invention is concerned with a method for permanently fixing the service pipe to the mains pipe  
15 to form a pressure-tight joint.

According to the present invention there is provided a method for forming a lateral connection between a first pipe and a second pipe, the method comprising introducing the end of the second pipe  
20 into a hole in the first pipe, said end of the second pipe carrying or incorporating electrically conducting elements, the second pipe being provided with means for inducing a current in said electrically conducting element, the current being such as to heat the  
25 elements thereby causing melting of the material of the



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first and/or second pipe in the vicinity of said hole so effecting a fused joint between the first and second pipe.

5 The electrically conducting elements may have a Curie point selected to be within the range of fusion temperature which is applicable for the pipes being joined together, for example a Curie point lying in the range from 200 to 300°C.

10 The pipes to be joined together may be made of polyethylene and the Curie point of the conductive material may then be in the range of from 230 to 280°C, preferably from 250 to 270°C. Alternatively the pipes to be joined together may be made of polypropylene and the Curie point of the conductive material may then lie  
15 in the range 250 to 300°C, preferably from 260 to 290°C.

In further embodiments the electrically conducting elements may be in the form of one or more perforated strips of metal, or may include a metal ring coated  
20 with polymeric material chosen so as to be capable of effecting a good bond to both the ring and the material of one of both pipes to be joined together.

An embodiment of the present invention will now be described, by way of example only, and with  
25 reference to the accompanying drawing which illustrates in diagrammatic sectional form a method of the invention.

Referring to the drawing, a mains pipe 1 has a circular hole 3 into which is positioned the end 5 of  
30 service pipe 7. The exterior surface of end 5 of surface pipe 7 is rebated to provide a shoulder 9 against which is fitted a ring 11 which is formed of a material called radiometal. Ring 11 is coated with a polymeric material chosen so as to be capable of

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effecting a good bond to the ring 11 as well as to the material of the plastics pipe 7.

An annular or part-annular depth stop 13 is fitted around the exterior surface of pipe 7 a short distance  
5 above shoulder 9. Abutting the upper surface of depth stop 13 and extending upwardly therefrom is a coil 15.

In order to arrive at the position shown in the drawing, a hole is first dug through ground 17 until the surface of mains pipe 1 is revealed. Hole 3 is  
10 then cut in mains pipe 1. Service pipe 7, carrying ring 11, depth stop 13 and coil 15, is then fed down to mains pipe 1 and inserted into hole 3 up to depth stop 13. Wires 19 and 21 extend from coil 15 to the surface. Wires 19 and 21 are connected to an R.F.  
15 generator and power is supplied to coil 15. A current is induced in ring 11, causing the temperature of the ring to increase. This in turn causes the melting and flow of the polymer surrounding ring 11 thereby effecting a fused joint between the end 5 of  
20 service pipe 7 and the mains pipe 1.

In an alternative embodiment the coil 15 is of a diameter less than that of the interior diameter of the service pipe and is lowered into position within the service pipe, this being a particularly convenient way  
25 of locating the coil in position.

Reference is made to our application PCT/GB 80/00062, the present invention being a particular application of the method described in the earlier application.

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CLAIMS:

1. A method for forming a lateral connection between a first pipe and a second pipe, characterised in that the method comprises introducing the end of the second pipe into a hole in the first pipe, said  
5 end of the second pipe carrying or incorporating electrically conducting elements, the second pipe being provided with means for inducing a current in said electrically conducting element, the current being such as to heat the elements thereby causing melting of  
10 the material of the first and/or second pipe in the vicinity of said hole so effecting a fused joint between the first and second pipe.

2. A method according to claim 1 characterised in that the electrically conducting elements are  
15 selected to have a Curie point within the range of fusion temperature which is applicable for the pipes being joined together.

3. A method according to claim 2 characterised in that the Curie point of the conductive material  
20 lies in the range from 200 to 300°C.

4. A method according to claim 2 or claim 3 characterised in that the pipes to be joined together are made of polyethylene and the Curie point of the  
25 conductive material is in the range of from 230 to 280°C.

5. A method according to claim 4 characterised in that the Curie point of the conductive material lies in the range 250 to 270°C.

6. A method according to claim 1 characterised  
30 in that the pipes to be joined together are made of polypropylene and the Curie point of the conductive material lies in the range 250 to 300°C.



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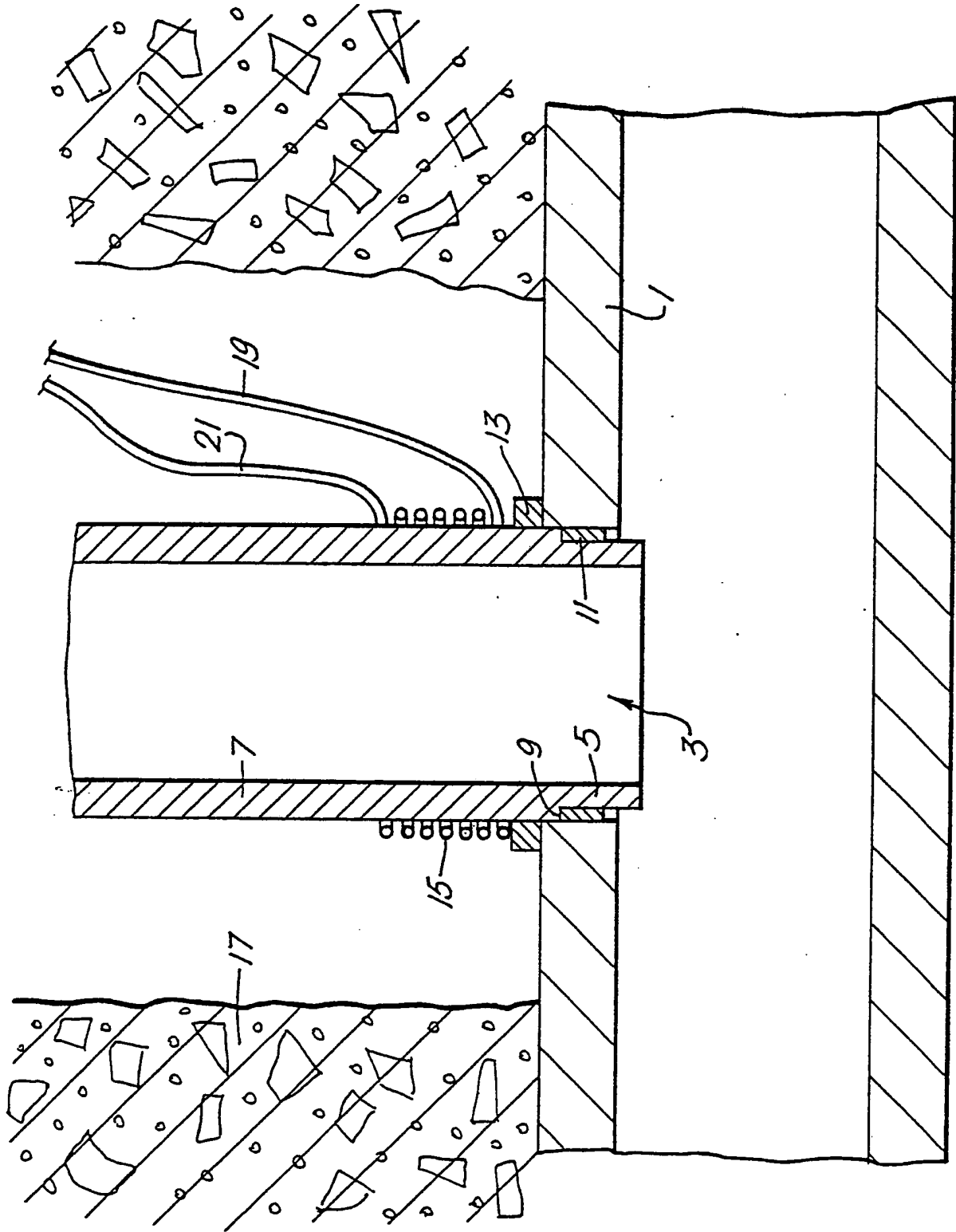
7. A method according to claim 6 characterised in that the Curie point of the conductive material lies in the range of from 260 to 290°C.

5 8. A method according to any of the preceding claims characterised in that said electrically conducting elements are in the form of one or more perforated strips of metal.

10 9. A method according to any of the preceding claims characterised in that the electrically conducting elements include a metal ring coated with polymeric material chosen so as to be capable of effecting a good bond to both the ring and the material of one of both pipes to be joined together.



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SUBSTITUTE SHEET





# INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 81/00027

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) <sup>3</sup> According to International Patent Classification (IPC) or to both National Classification and IPC Int.Cl. <sup>3</sup> : B 29 C 27/04; B 23 K 13/00														
<b>II. FIELDS SEARCHED</b> <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black;">Minimum Documentation Searched <sup>4</sup></div> <div style="display: flex; justify-content: space-between;"> <div style="width: 20%; border-bottom: 1px solid black;">Classification System</div> <div style="width: 80%; border-bottom: 1px solid black;">Classification Symbols</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 20%; border-right: 1px solid black; padding-right: 5px;">Int.Cl.<sup>3</sup></div> <div style="width: 80%; padding-left: 5px;">B 29 C 27/04; B 23 K 13/00</div> </div> <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black; margin-top: 10px;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>5</sup></div>														
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>14</sup> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 10%; text-align: left;">Category <sup>6</sup></th> <th style="width: 60%; text-align: left;">Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup></th> <th style="width: 30%; text-align: left;">Relevant to Claim No. <sup>15</sup></th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">E/P</td> <td>WO, A, 80/02124, published October 16, 1980 see the whole document, Haxey ---</td> <td style="vertical-align: top;">1-9</td> </tr> <tr> <td></td> <td>US, A, 3954541, published May 4, 1976, see the whole document, Mannesmann ---</td> <td style="vertical-align: top;">1</td> </tr> <tr> <td></td> <td>FR, A, 1244868, published September 19, 1960 see the whole document, Doyen -----</td> <td style="vertical-align: top;">1</td> </tr> </tbody> </table>			Category <sup>6</sup>	Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No. <sup>15</sup>	E/P	WO, A, 80/02124, published October 16, 1980 see the whole document, Haxey ---	1-9		US, A, 3954541, published May 4, 1976, see the whole document, Mannesmann ---	1		FR, A, 1244868, published September 19, 1960 see the whole document, Doyen -----	1
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<div style="font-size: small;"> <sup>6</sup> Special categories of cited documents: <sup>15</sup>            "A" document defining the general state of the art            "E" earlier document but published on or after the international filing date            "L" document cited for special reason other than those referred to in the other categories            "O" document referring to an oral disclosure, use, exhibition or other means            "P" document published prior to the international filing date but on or after the priority date claimed            "T" later document published on or after the international filing date or priority date and not in conflict with the application, but cited to understand the principle or theory underlying the invention            "X" document of particular relevance         </div>														
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